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[Claim(s)]

[Claim 1] The exhaust gas purifying catalyst of the engine characterized by being the exhaust gas purifying catalyst installed in an engine exhaust air system, and preparing the catalyst bed containing the catalyst precious metals, the cerium oxide which has oxygen occlusion capacity, and the zeolite which has adsorbent [which was excellent to HC ingredient of a high boiling point].

[Claim 2] The cerium oxide catalyst particle with which the catalyst precious metals which become the particles formed with cerium oxide from palladium were supported, The exhaust gas purifying catalyst of the engine according to claim 1 characterized by constituting a catalyst bed with the zeolite catalyst particles with which the catalyst precious metals which become the particles formed of the zeolite from palladium were supported.

[Claim 3] The exhaust gas purifying catalyst of the engine according to claim 1 or 2 characterized by making a catalyst bed contain the zeolite which has the pole diameter of 5A or more.

[Claim 4] The exhaust gas purifying catalyst of the cerium oxide which constitutes a catalyst bed, and the engine according to claim 1 to 3 characterized by setting the rate of a zeolite to total weight with a zeolite as 2.5 - 13wt% of within the limits..

[Claim 5] The exhaust gas purifying catalyst of the engine according to claim 1 to 4 characterized by arranging the 2nd catalyst bed containing the catalyst precious metals, cerium oxide, and a zeolite on the 1st catalyst bed containing an aluminum oxide and the catalyst precious metals.

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] This invention relates to the exhaust gas purifying catalyst of the engine which purifies engine exhaust gas.

[0002]

[Description of the Prior Art] While preparing the 1st quart layer which consists of an alumina layer containing the rhodium on catalyst support so that it may be shown in the former, for example, JP,H3-56139,A The exhaust gas purifying catalyst which prepares the 2nd quart layer which consists of cerium oxide particles which fixed palladium, and activated alumina particles on this 1st quart layer is proposed.

[0003] The above-mentioned exhaust gas purifying catalyst is replaced with the platinum generally used as the catalyst precious metals which constitute a three way component catalyst. It is the three way component catalyst it was made to raise the low-temperature activity of a catalyst by using palladium. By catalyst support's dividing the above-mentioned palladium up and down, and making it support, by controlling the sintering (condensation) and carrying out occulusion of the oxygen to cerium oxide, it is constituted so that exhaust gas may be purified effectively.

[0004]

[Problem to be solved by the invention] In the general exhaust gas purifying catalyst (Pt system catalyst) which uses the catalyst precious metals which serve as an exhaust gas purifying catalyst (Pd system catalyst) which has cerium oxide etc. from platinum in the catalyst precious metals which consist of palladium as mentioned above Comparison of the relation between the mileage of a car and the output of HC (hydrocarbon) ingredient obtained the data shown in drawing 10 . In addition, HC output shown in above-mentioned drawing 10 shows the total output in the driving test in the FTP mode which is a U.S. standard test mode.

[0005] Since palladium is excellent in low-temperature activity from the above-mentioned data with Pd system catalyst, The catalysis and an oxygen discharge operation of the above-mentioned cerium oxide show that HC output of exhaust gas increases remarkably according to increase of mileage, and there is a trend for the purifying rate of exhaust gas to fall at an early stage, although there is little HC output of the emission gas in the early stages of a run compared with Pt system catalyst.

[0006] [the early decline in the purifying rate in the above-mentioned Pd system catalyst] HC poisoning which HC ingredient of the high boiling point which becomes the cerium oxide in a catalyst bed from toluene etc. chemisorbs occurs, the oxygen occlusion capacity of the above-mentioned cerium oxide particles declines by this, and it is thought that it originates in cerium oxide stopping functioning as an oxygen supply. That is, when the status of the above-mentioned Pd system catalyst that the purifying rate of exhaust gas fell was analyzed, it turned out that it is checked that the cerium oxide in a catalyst bed is adsorbed so much in HC ingredient of the high boiling point which consists of toluene etc., it originates in this HC

poisoning, and decline in the purifying rate of exhaust gas is produced.
[0007] Are made in order that this invention may solve the above-mentioned problem, and generating of HC poisoning by HC ingredient of the high boiling point contained in exhaust gas chemisorbing in cerium oxide is controlled. The exhaust gas purifying catalyst of the engine which can prevent decline in the purifying rate of exhaust gas effectively is offered.
[0008]
[Means for solving problem] Invention concerning Claim 1 is an exhaust gas purifying catalyst installed in an engine exhaust air system, and prepares the catalyst bed containing the catalyst precious metals, the cerium oxide which has oxygen occlusion capacity, and the zeolite which has adsorbent [which was excellent to HC ingredient of a high boiling point].
[0009] Since it adsorbs to the zeolite which HC ingredient of the high boiling point contained in exhaust gas contained in the catalyst bed effectively according to this composition, generating of HC poisoning resulting from HC ingredient of a high boiling point chemisorbing in the cerium oxide in the above-mentioned catalyst bed will be controlled effectively.
[0010] Invention concerning Claim 2 is set to the exhaust gas purifying catalyst of an engine given [above-mentioned] in Claim 1. The cerium oxide catalyst particle with which the catalyst precious metals which become the particles formed with cerium oxide from palladium were supported, and the zeolite catalyst particles with which the catalyst precious metals which become the particles formed of the zeolite from palladium were supported constitute a catalyst bed.
[0011] Since the palladium which was excellent in low-temperature activity as the catalyst precious metals was used according to this composition, in low temperature, exhaust gas will be purified effectively. Moreover, since the above-mentioned palladium is supported by the particles of cerium oxide, and the particles of the zeolite, respectively, it will be prevented effectively that originate in palladium being supported with high density in the particles of the above-mentioned zeolite etc., and a sintering phenomenon arises in palladium.
[0012] Invention concerning Claim 3 makes the zeolite which has the pole diameter of 5A or more in a catalyst bed contain in the exhaust gas purifying catalyst of an engine above-mentioned Claim 1 or given in two.
[0013] According to this composition, as a zeolite which constitutes a catalyst bed FAU (faujasite), Since what has big pole diameters, such as beta type zeolite, MOR (mordenite), LTL (L-form zeolite), or MFI (ZSM-5), was used, The operation which is effectively adsorbed to the above-mentioned zeolite and to which HC ingredient of the high boiling point contained in exhaust gas controls HC poisoning of cerium oxide effectively will be acquired.
[0014] Invention concerning Claim 4 sets the rate of the cerium oxide which constitutes a catalyst bed in the exhaust gas purifying catalyst of an engine given in above-mentioned Claim 1 - either of three, and the zeolite made into total weight with a zeolite at a pair as 2.5 - 13wt%

of within the limits.

[0015] While the effect which controls HC poisoning of cerium oxide by the above-mentioned zeolite is fully demonstrated according to this composition, the amount of cerium oxide will fully be secured and occulusion of a proper quantity of oxygen will be carried out to this cerium oxide.

[0016] Invention concerning Claim 5 is set to the exhaust gas purifying catalyst of an engine given in above-mentioned Claim 1 - either of four. The 2nd catalyst bed containing the catalyst precious metals, cerium oxide, and a zeolite is arranged on the 1st catalyst bed containing an aluminum oxide and the catalyst precious metals which consist of palladium.

[0017] While HC ingredient in exhaust gas is effectively purified by the aluminum oxide ingredient and palladium component of the 1st catalyst bed according to this composition By heating the 2nd catalyst bed arranged in that upper part by the catalytic reaction heat by the 1st catalyst bed of the above, HC poisoning of the cerium oxide contained in this 2nd catalyst bed will be prevented effectively.

[0018]

[Mode for carrying out the invention] Drawing 1 and drawing 2 show the embodiment of the exhaust gas purifying catalyst of the engine concerning this invention. This exhaust gas purifying catalyst has the catalyst support 2 of honeycomb structure in which two or more breakthroughs 1 into which the exhaust gas discharged from the engine is introduced were formed, the 1st catalyst bed 3 supported by the wall surface of the breakthrough 1 of this catalyst support 2, and the 2nd catalyst bed 4 arranged in that upper part.

[0019] The 1st catalyst bed 3 of the above is constituted by the aluminum oxide catalyst particle 7 with which the catalyst precious metals which become the particles of an aluminum oxide (Al2O3) from palladium were supported. Moreover, the cerium oxide catalyst particle 5 with which the noble metal catalyst which becomes the particles which consist of cerium oxide (CeO2) with which the 2nd catalyst bed 4 of the above has oxygen occlusion capacity from palladium (Pd) was supported, It is formed with the zeolite catalyst particles 6 with which the noble metal catalyst was supported by the particles which consist of a zeolite.

[0020] [the zeolite which constitutes the zeolite catalyst particles 5 of the 2nd catalyst bed 4 of the above] It is formed by the zeolite which has adsorbent [which was excellent to HC ingredient of the high boiling point which consists of HC ingredient which has the character to which it is easy to carry out HC poisoning of the cerium oxide, i.e., toluene, hexane, or benzene], for example, FAU etc., (faujasite).

[0021] Moreover, the rate of the zeolite to the total weight of the cerium oxide which constitutes the 2nd catalyst bed 4 of the above, and a zeolite is set as 2.5 - 13wt% of within the limits. [this] if the effect which controls HC poisoning of cerium oxide by a zeolite is fully acquired no longer and the rate of a zeolite increases more than 13wt% so that it may mention later, if the

rate of a zeolite becomes less than [2.5wt%] It is because the function which purifies HC ingredient in exhaust gas by the oxygen which the amount of cerium oxide will decrease relatively, and occulusion of a proper quantity of oxygen will not be carried out to this cerium oxide, and is supplied from this cerium oxide will fall.

[0022] In addition, although the catalyst precious metals contained in the 1st and 2nd catalyst bed 3 and 4 of the above are not restricted to the above-mentioned palladium (Pd) but are usable in other precious metals, such as platinum (Pt) or rhodium (Rh), when the above-mentioned palladium is used, there is an advantage of excelling in low-temperature activity. [moreover, the amount of support of the catalyst precious metals to the capacity of the above-mentioned catalyst support 2] In using palladium as these catalyst precious metals although not limited in particular if it is 0.1g/l. or more In order to prevent that the unnecessary catalyst precious metals are supported, fully maintaining the exhaust gas depuration function, it is desirable to set up the amount of support to the catalyst support 2 within the limits of 3-15g/l.

[0023] The embodiment of the manufacture procedure of the above-mentioned exhaust gas purifying catalyst is explained below. First, 480g of powder of gamma-alumina (gamma-Al2O3) and Boehmite 120g, After creating a slurry 1l. of water, and by mixing and agitating ten cc of nitric acid (HNO3), the catalyst support 2 which becomes this slurry from heat-resistant metal material or ceramic material is immersed, the above-mentioned slurry is made to adhere to this catalyst support 2, and it pulls up.

[0024] And by calcinating for about 2 hours at the temperature about 600 degreeC, after blowing away the excessive slurry adhering to the catalyst support 2 by air blow and drying for about 2 hours at the temperature about 250 degreeC The layer of the gamma-alumina which has many pores is formed in the intine side of each breakthrough 1 formed in the catalyst support 2.

[0025] Subsequently, the above-mentioned catalyst support 2 is immersed in the dinitro SHIAMIN palladium solution adjusted so that the layer of the above-mentioned gamma-alumina might be made to support palladium of the specified quantity and the 1st catalyst bed 3 might be formed. After making this dinitro SHIAMIN palladium solution adhere to the layer of the above-mentioned gamma-alumina, the 1st catalyst bed 3 is formed by performing dryness of about 2 hours under the temperature about 250 degreeC, and calcination of about 2 hours under the temperature about 600 degreeC.

[0026] Moreover, after mixing and agitating cerium oxide and a zeolite so that the rate of a zeolite to the total weight of cerium oxide and a zeolite may become 2.5 - 13wt%, this is made to agitate and dry the dinitro SHIAMIN palladium solution of the specified quantity moreover. And by grinding this calcination thing with a ball mill, after calcinating for about 2 hours under the temperature about 700 degreeC The cerium oxide catalyst particle 5 with which palladium was supported by the powder of cerium oxide, and the zeolite catalyst powder 6 with which

palladium was supported by the powder of the zeolite are formed.

[0027] Then, 540g of mixtures of the above-mentioned cerium oxide catalyst powder 5 and the zeolite catalyst powder 6, After creating a slurry Boehmite 60g and by mixing ten cc of nitric acid (HNO3) with 1l. of water, and agitating, the above-mentioned catalyst support 2 is immersed in this slurry, the above-mentioned slurry is made to adhere to this carrier 2, and it pulls up. And by calcinating for about 2 hours at the temperature about 600 degreeC, after blowing away the excessive slurry adhering to the catalyst support 2 by air blow and drying for about 2 hours at the temperature about 200 degreeC The 2nd catalyst bed 4 constituted with the cerium oxide catalyst powder 5 and the zeolite catalyst powder 6 is formed on the 1st catalyst bed 3 of the above.

[0028] The cerium oxide catalyst particle 5 with which the catalyst precious metals, such as palladium, were supported by the particles in which the exhaust gas purifying catalyst of the above-mentioned composition was formed with cerium oxide, Since it has the catalyst bed which consists of zeolite catalyst particles 6 with which the ****** precious metals, such as palladium, were supported by the particles formed of the zeolite which has adsorbent [which was excellent to HC ingredient of a high boiling point], HC ingredient of the high boiling point which consists of toluene etc. chemisorbs in cerium oxide, and it can prevent effectively that this cerium oxide carries out HC poisoning. Therefore, oxygen of sufficient quantity for the above-mentioned cerium oxide is made to absorb, by the oxygen emitted from this cerium oxide, and the catalysis of the above-mentioned catalyst precious metals, HC ingredient in exhaust gas can be oxidized effectively, and exhaust gas can be purified.

[0029] The example of an experiment which checks the performance of a gas cleanup catalyst of having the above-mentioned catalyst bed and which went to accumulate is explained below. The catalyst precious metals with which the amount of support to the catalyst support 2 becomes this experiment from the palladium set [l.] up in 10g /, The exhaust gas purifying catalyst which contains cerium oxide and the zeolite which consists of FAU, and requires the rate of a zeolite to the total weight of the above-mentioned cerium oxide and a zeolite for the work example A of this invention which has the catalyst bed set up to 10wt%, The exhaust gas purifying catalyst concerning the comparative example B which has the catalyst bed constituted by the noble metal catalyst which omits the above-mentioned zeolite and consists of cerium oxide and palladium was used.

[0030] And while circulating 1000 ppm toluene for 20 minutes to each above-mentioned exhaust gas purifying catalyst under the temperature of 300 degreeC and making it adsorb The mimesis exhaust gas with which the air-fuel ratio (A/F) was set as 14.7**0.9 under the temperature of 200 degreeC was supplied with the space velocity (SV) of 60000h-1, and the purifying rate of HC ingredient in exhaust gas was measured, respectively.

[0031] After making toluene adsorb before making toluene stick to the above-mentioned

exhaust gas purifying catalyst [the exhaust gas purifying catalyst concerning the work example A of this invention] as shown in drawing 3 when the purifying rate of HC ingredient compares how it changes By the exhaust gas purifying catalyst concerning a comparative example B, it was checked to the purifying rate of HC ingredient hardly changing before and after adsorption of toluene that the purifying rate of HC ingredient is falling sharply after adsorption of toluene.

[0032] Moreover, when IR-spectrum (infrared absorption spectrum) analysis which checks the adsorbed state of the toluene to cerium oxide is conducted in the above-mentioned example of an experiment, [a comparative example B] As shown in drawing 4 , as shown in drawing 5 , in the work example A of this invention, the comparatively low thing with a high peak value of chemisorbed HC kind was checked to the thing with a high peak value of chemisorbed HC kind. Since a zeolite is effectively adsorbed in toluene when a catalyst bed is made to contain the zeolite which becomes a catalyst bed from FAU as shown in the above-mentioned work example A, this shows that the quantity of the toluene chemisorbed in cerium oxide decreases, and generating of the HC poisoning is controlled effectively.

[0033] Subsequently, the exhaust gas purifying catalyst concerning the work example A of above-mentioned this invention and the exhaust gas purifying catalyst concerning the above-mentioned comparative example B, Replace with the zeolite of the exhaust gas purifying catalyst concerning the above-mentioned work example A, and the comparative example C which makes a catalyst bed come to contain an aluminum oxide (Al2O3) is used. When the change status of the purifying rate of HC ingredient at the time of changing various circulation time of toluene was measured, data as shown in drawing 6 was obtained.

[0034] [when circulation time of toluene is lengthened in the work example A of this invention from the above-mentioned data] By the comparative example B which is not making a catalyst bed contain both a zeolite and an aluminum oxide, it was checked to the purifying rate of HC ingredient not falling so greatly that the purifying rate of HC ingredient falls notably according to the circulation time of toluene becoming long.

[0035] Moreover, in the comparative example C which replaces with the above-mentioned zeolite and makes a catalyst bed come to contain an aluminum oxide, while the purifying rate of HC ingredient when the circulation time of toluene is short was good, it was checked that the purifying rate of HC ingredient falls rapidly according to the circulation time of toluene becoming long. The above-mentioned aluminum oxide which contained this in the catalyst bed has the small absorption capacity of toluene, and it is shown that the adsorption capacity power of toluene is spoiled at an early stage.

[0036] Furthermore, in the exhaust gas purifying facility concerning this invention, when the experiment which checks the influence the rate of the zeolite contained in the catalyst bed has on the purifying rate of HC ingredient was conducted, data as shown in drawing 7 was

obtained. Namely, it is set as the comparatively (wt%) various values of the zeolite to the total weight of the cerium oxide which constitutes a catalyst bed, and a zeolite. When [of the zeolite] the purifying rate of HC ingredient after adsorption of toluene was measured, respectively, and it was set comparatively (wt%) as 2.5 - 13wt% of within the limits, it was checked that HC ingredient in exhaust gas can be purified effectively.

[0037] When the rate of a zeolite becomes less than [2.5wt%], this since there are few amounts of zeolites Since the amount of cerium oxide will decrease relatively if the effect which controls HC poisoning of the above-mentioned cerium oxide by this zeolite becomes inadequate and the rate of a zeolite increases more than 13wt% It is because it becomes impossible to carry out occulusion of a proper quantity of oxygen to this cerium oxide and oxygen required for depuration of HC ingredient is no longer obtained.

[0038] [moreover, the zeolite equipped with the function which controls HC poisoning of the above-mentioned cerium oxide] If it is the zeolite which has adsorbent [which was excellent to HC ingredient of the high boiling point which consists of toluene etc.] It is not restricted to Above FAU (faujasite), but the zeolite which has the pole diameter of 5A or more, for example, beta type zeolite, MOR (mordenite), LTL (L-form zeolite), or MFI (ZSM-5) can be applied.

[0039] As shown in drawing 8 , namely, CHA (Shaba site), FER (ferrierite), The place which used the exhaust gas purifying catalyst which makes a catalyst bed come to contain the zeolite which has various pole diameters, such as MFI (ZSM-5), beta type zeolite, and MOR (mordenite), LTL (L-form zeolite), and measured the purifying rate of HC ingredient after adsorption of toluene, respectively, When a catalyst bed was made to contain the above-mentioned zeolite which has the pole diameter of 5A or more, it was checked that HC ingredient in exhaust gas can be purified effectively. If this is 5A or more in pole diameter of a zeolite, it can adsorb effectively HC ingredient of the above-mentioned large high boiling point of a molecular weight, and will be considered to be because for HC poisoning of the above-mentioned cerium oxide to be prevented effectively.

[0040] Moreover, the cerium oxide catalyst particle 5 by which the catalyst precious metals which become the particles formed with cerium oxide from palladium were supported with the above-mentioned embodiment, Since the zeolite catalyst particles 6 with which the catalyst precious metals which become the particles formed of the zeolite from palladium were supported constituted the catalyst bed, the particles of cerium oxide and the particles of a zeolite can be distributed and the above-mentioned palladium can be made to support. Therefore, it can prevent that the catalyst precious metals which consist of the above-mentioned palladium are supported with high density, and can prevent that a sintering phenomenon arises in this palladium. And since the palladium which was excellent in low-temperature activity as the above-mentioned catalyst precious metals was used, exhaust gas can be purified effectively in a low temperature region.

[0041] As shown in the above-mentioned embodiment, an aluminum oxide and the catalyst precious metals which consist of palladium on the 1st catalyst bed 3 to contain Moreover, the above-mentioned catalyst precious metals, When the 2nd catalyst bed 4 containing cerium oxide and a zeolite is arranged While the aluminum oxide and palladium of the 1st catalyst bed 3 can purify HC ingredient in exhaust gas effectively, the 2nd catalyst bed 4 arranged in the upper part by the catalytic reaction heat by the 1st catalyst bed 3 of the above can be heated.
[0042] Therefore, generating of the above-mentioned HC poisoning can be controlled still more effectively by making it secede from HC ingredient of which the cerium oxide contained in the 2nd catalyst bed 4 of the above was adsorbed effectively. And there is an advantage that sintering (condensation) of the above-mentioned palladium can be controlled effectively, by distributing the 1st catalyst bed 3 and the 2nd catalyst bed 4, and making the catalyst precious metals which consist of palladium as mentioned above support.
[0043] In addition, the 1st catalyst bed 3 formed by making the particles which consist of an aluminum oxide support palladium, It has the 2nd catalyst bed 4 which consists of zeolite catalyst particles 6 which made the cerium oxide catalyst particle 5 which made the particles of cerium oxide support palladium, and the particles of the zeolite support palladium. And the 1st work example A1 of this invention to which it comes [l.] to set up the amount of support of palladium of the 1st and 2nd catalyst bed 3 and 4 to the catalyst support 2 in 5g /, respectively, The 2nd work example A2 constituted like the 1st work example A1 of the above except for the point that the amount of support of palladium of the 1st catalyst bed 3 was set as the half, When the purifying rate of HC ingredient after adsorption of the above-mentioned toluene was measured in the 1st work example A1 of the above, and the 3rd work example A3 constituted similarly except for the point which uses platinum (Pt) as the catalyst precious metals of the 1st catalyst bed 3, respectively, data as shown in drawing 9 was obtained.
[0044] The oxidization palladium which the kind of catalyst precious metals which constitute the 1st downward catalyst bed 3, and its amount of support are not [how] scrupulous, and has oxygen occlusion capacity from the data shown in above-mentioned drawing 9 , When the 2nd catalyst bed 4 containing the zeolite which has adsorbent [which was excellent to HC ingredient of a high boiling point], and the catalyst precious metals which consist of palladium is formed The 1st catalyst bed constituted by the ingredient which makes the particles which consist of an aluminum oxide come to support palladium, It compared with the exhaust gas purifying catalyst concerning the comparative example B which has the 2nd catalyst bed constituted by the ingredient which makes it come to support the noble metal catalyst which omits the above-mentioned zeolite and becomes the particles of cerium oxide from palladium, and it was checked that the purifying rate of HC ingredient after toluene adsorption is maintainable to a proper value.
[0045]

[Effect of the Invention] [invention concerning Claim 1] as explained above Since it is the exhaust gas purifying catalyst installed in an engine exhaust air system and the catalyst bed containing the catalyst precious metals, the cerium oxide which has oxygen occlusion capacity, and the zeolite which has adsorbent [which was excellent to HC ingredient of a high boiling point] was prepared, HC poisoning of the cerium oxide by HC ingredient of the high boiling point which consists of toluene etc. chemisorbing in cerium oxide can be prevented effectively. Therefore, there is an advantage that HC ingredient is oxidized effectively and exhaust gas can be purified by the oxygen which is made to carry out occulusion of a proper quantity of oxygen to the above-mentioned cerium oxide, and is emitted from this cerium oxide, and the catalysis of the above-mentioned catalyst precious metals.

[0046] Moreover, the cerium oxide catalyst particle with which the catalyst precious metals with which invention concerning Claim 2 becomes the particles formed with cerium oxide from palladium were supported, Since the zeolite catalyst particles with which the catalyst precious metals which become the particles formed of the zeolite from palladium were supported constituted the catalyst bed, It can prevent on an arising [originate in palladium being supported with high density by the above-mentioned zeolite particles etc., and / the sintering phenomenon of palladium] effect target. Furthermore, since the palladium which was excellent in low-temperature activity as the above-mentioned catalyst precious metals was used, there is an advantage that exhaust gas can be effectively purified in low temperature.

[0047] Invention concerning Claim 3 to the above-mentioned catalyst bed Moreover, FAU (faujasite), Since the zeolite which has pole diameters of 5A or more, such as beta type zeolite, MOR (mordenite), LTL (L-form zeolite), or MFI (ZSM-5), was made to contain, HC ingredient of the above-mentioned large high boiling point of a molecular weight can be adsorbed effectively, and HC poisoning of the above-mentioned cerium oxide can be prevented effectively. Therefore, occulusion of a proper quantity of oxygen is carried out to the above-mentioned cerium oxide, by the oxygen emitted from this cerium oxide, and the catalysis of the above-mentioned catalyst precious metals, HC ingredient can be oxidized effectively and exhaust gas can be purified.

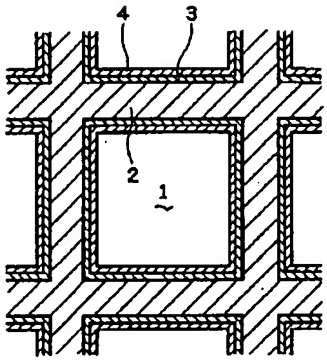
[0048] Moreover, since invention concerning Claim 4 set the rate of the zeolite to the total weight of the cerium oxide which constitutes a catalyst bed, and a zeolite as 2.5 - 13wt% of within the limits, While fully being able to secure the amount of support of the above-mentioned zeolite and being able to control HC poisoning of cerium oxide certainly by this zeolite The fall of the oxygen occlusion capacity by the amount of cerium oxide decreasing can be prevented, and the oxygen supplied from this cerium oxide can purify HC ingredient in exhaust gas effectively.

[0049] Moreover, since invention concerning Claim 5 arranged the 2nd catalyst bed containing the catalyst precious metals, cerium oxide, and a zeolite on the 1st catalyst bed containing an

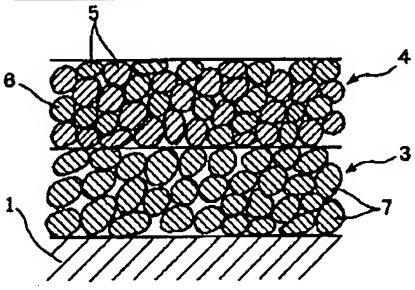
aluminum oxide and the catalyst precious metals, While the aluminum oxide and palladium of the 1st catalyst bed can purify HC ingredient in exhaust gas effectively By heating the 2nd catalyst bed arranged in that upper part by the catalytic reaction heat by the 1st catalyst bed of the above, there is an advantage that HC poisoning of the cerium oxide contained in this 2nd catalyst bed can be prevented effectively.

[Brief Description of the Drawings]
[Drawing 1] It is the whole explanatory view showing the embodiment of the exhaust gas purifying catalyst concerning this invention.
[Drawing 2] It is the elements-on-larger-scale explanatory view showing the important section of an exhaust gas purifying catalyst.
[Drawing 3] It is the graph which shows the change status of the purifying rate of HC ingredient by adsorption of toluene.
 [Drawing 4] It is an IR-spectrum figure at the time of making toluene stick to the catalyst bed concerning a comparative example.
[Drawing 5] It is an IR-spectrum figure at the time of making toluene stick to the catalyst bed concerning the work example of this invention.
[Drawing 6] It is the graph which shows the relation between the circulation time of toluene, and change status of the purifying rate of HC ingredient.
[Drawing 7] It is the graph which shows the relation between the rate of a zeolite, and the purifying rate of HC ingredient.
[Drawing 8] It is the graph which shows the relation between the pole diameter of a zeolite, and the purifying rate of HC ingredient.
[Drawing 9] It is the graph which shows a relation with the purifying rate of the ingredient of the 1st catalyst bed, and HC ingredient.
[Drawing 10] It is the graph which shows the relation between the mileage of a car, and the output of HC ingredient.
[Explanations of letters or numerals]
3 1st Catalyst Bed
4 2nd Catalyst Bed
5 Cerium Oxide Catalyst Particle
6 Zeolite Catalyst Particles

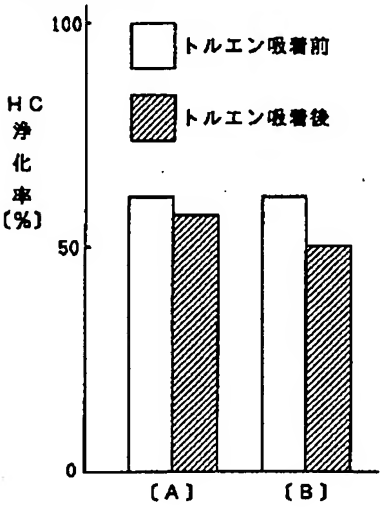
[Drawing 1]



[Drawing 2]



[Drawing 3]



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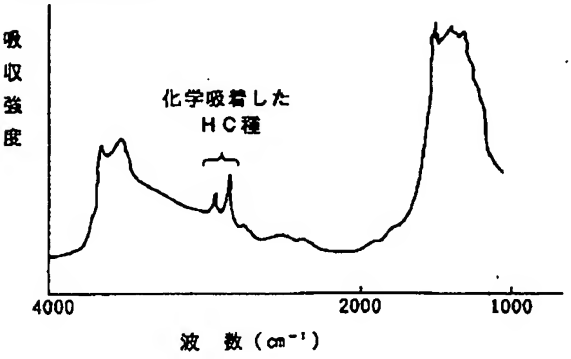
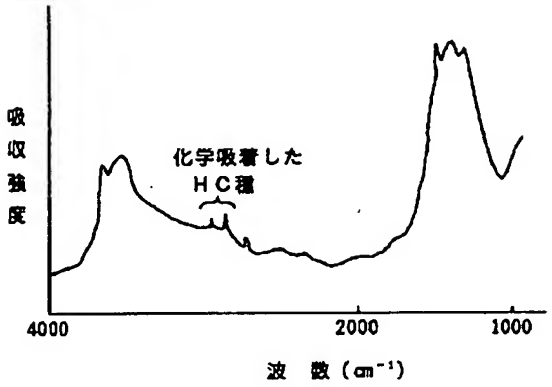
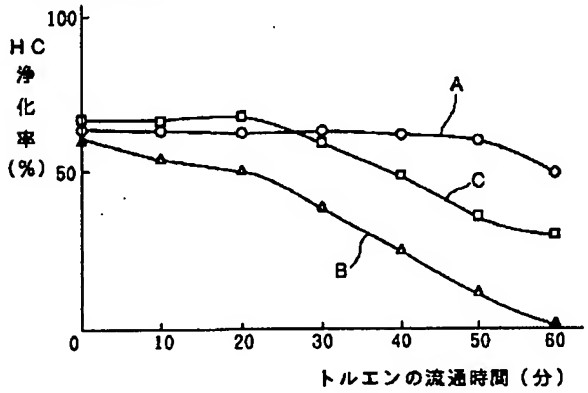


[Drawing 5]



[Drawing 6]



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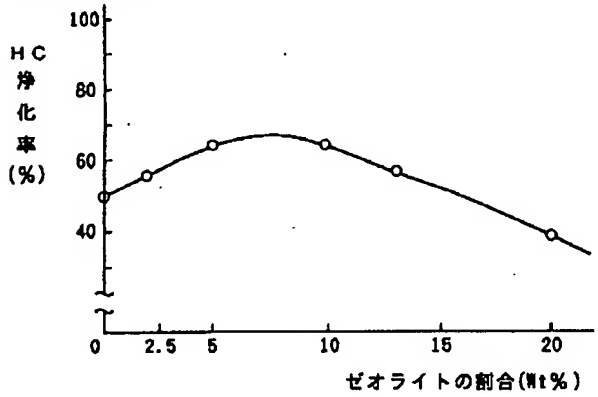
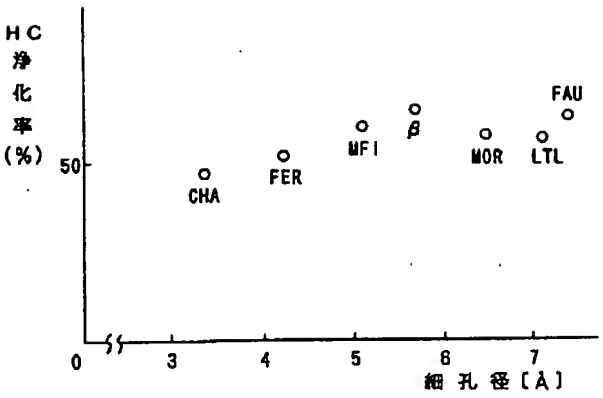
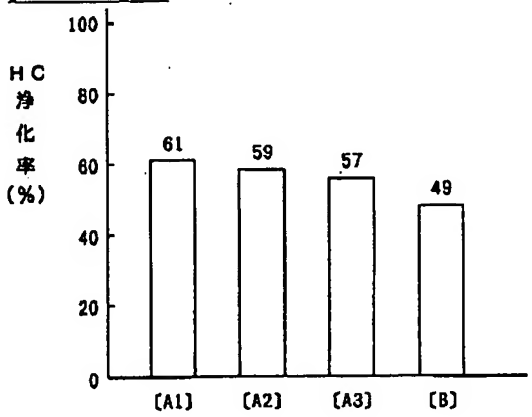


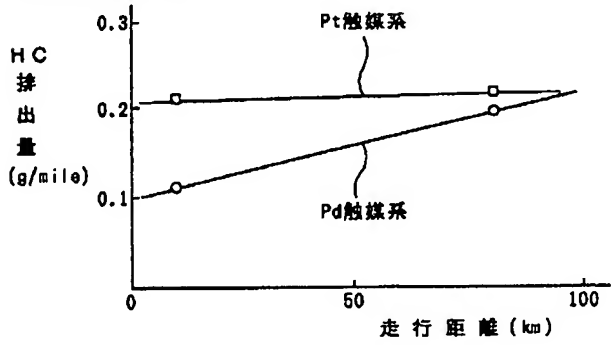
[Drawing 8]



[Drawing 9]



[Drawing 10]



[Translation done.]